

ABSTRACT OF THE DISCLOSURE
METHOD FOR CUTTING OF NONMETALLIC MATERIALS AND A DEVICE
FOR CARRYING OUT SAID METHOD

The invention relates generally to the methods for machining of materials, dicing nonmetallic materials. More specifically, the present invention relates to a method for laser scribing of transparent non-metallic materials, mainly especially firm (as corundum) with semiconductor coverings, glasses, glass ceramics, ceramics etc. The invention can be used in electronic industry for cutting plates, optical elements, crystals, chipping, clipping liquid crystal indicators and photo masks, magnetic and magneto-optic disks, and also for manufacturing glasses and mirrors, etc. The task of the invention is the creation of a method for cutting transparent nonmetallic, especially firm and extra-firm materials, including materials with semiconductor structure coats, by originally shaped laser beam. The laser pulse with a certain set of parameters provides mechanism for a breakdown of a material by shock and multiphoton ionization, consequently creating the defect of a very small size (close to a diffractive limit), and, due to choosing of correct distance between breakdown points the practical conformity to energy of a laser pulse and energy necessary for formation a crack between 2 breakdown points is reached.